Lab: Applying Hess’ Law

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

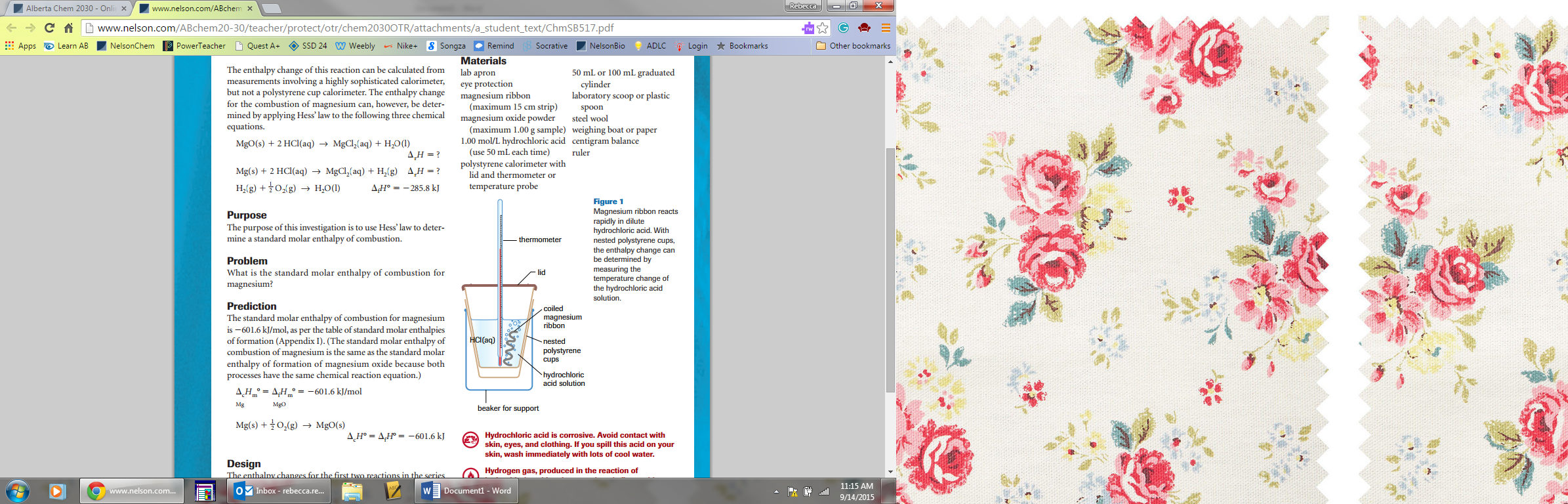
The purpose of this investigation is to use Hess’ law to determine a standard molar enthalpy of combustion.

**Problem:** What is the standard molar enthalpy of combustion for magnesium?

Mg(s) + ½ O2(g) → MgO(s) ∆cHm ???

**Materials:**

* Eye protection
* Magnesium ribbon
* 1.00M hydrochloric acid solution
* Calorimeter
* Thermometer
* 100mL graduated cylinder
* Scale



**Procedure:**

1. Using your graduated cylinder, measure out 50mL of acid
2. Weigh your magnesium strip
3. Assemble your calorimeter, as discussed in class, creating room for your thermometer
4. Pour acid into the calorimeter and add your magnesium
5. Seal the calorimeter, place your thermometer and observe temperature change

**Observations:**

|  |  |
| --- | --- |
| **Mass of Magnesium Strip** |  |
| **Initial Temperature of Solution** |  |
| **Final Temperature of Solution** |  |
| **Temperature Change** |  |

**Calculations:**

1. **Using your data, show your calculation for the ∆rHm for your reaction. (2 marks)**

Mg(s) + 2 HCl(aq) → MgCl2(aq) + H2(g)

1. **Use Hess’ Law with the equations provided to solve the problem. (3 marks)**

Mg(s) + ½ O2(g) → MgO(s) ∆cHm ???

MgO(s) + 2 HCl(aq) → MgCl2(aq) + H2O(l) **∆rH** -151.0 KJ

Mg(s) + 2 HCl(aq) → MgCl2(aq) + H2(g) **∆rH** From Qu #1

H2(g) + ½ O2(g) → H2O(l) **∆fH°** -285.8 KJ